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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
WOZNIAK, JAMES S	

ART UNIT	PAPER NUMBER
2655	

DATE MAILED: 11/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/692,291	RAMO ET AL.	
	Examiner	Art Unit	
	James S. Wozniak	2655	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 September 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. In response to the office action from 6/10/2005, the applicant has submitted an amendment, filed 9/13/2005, amending claims 1, 7, 11-13, 16, 17, 20, and 24, while arguing to traverse the art rejection based on the amended limitations *(Amendment, page 8)*. The applicant's arguments have been fully considered but are moot with respect to the new grounds of rejection, necessitated by the claim amendments and in view of Gao *(U.S. Patent: 6,449,590)*.

Claim Objections

2. **Claim 2** is objected to because of the following informalities: "the decoder" in line 5 should be changed to --a decoder-- to provide proper antecedent basis.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. **Claims 1-5, 7-12, 15, 17, and 20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al *("A Very Low Bit Rate Speech Coder Based on a Recognition/Synthesis Paradigm," 2001)* in view of Gao *(U.S. Patent: 6,449,590)*.

With respect to **Claim 1**, Lee discloses:

Creating, based on the pitch contour data, a plurality of simplified pitch contour segment candidates, each candidate corresponding to a sub-segment of the audio signal, wherein each sub-segment and candidate has a start-point pitch value and an end point pitch value *(Section V.A., Pages 486-487)*;

Measuring deviation between each of the simplified pitch contour segment candidates and said pitch values in the corresponding sub-segment; selecting a plurality of consecutive segment candidates to represent the audio segment based on the measured deviations and one or more pre-selected criteria *(error and selecting candidates with error below a threshold amount, Section V.A., Page 486-487; and Fig. 5)*; and

Coding the pitch contour data in the sub-segments of the audio signal corresponding to the selected segment candidates with characteristics of the selected candidate *(Section V, Page 486)*.

Lee does not specifically suggest that start and end points of a pitch contour sub-segment candidate may vary from that of an original speech sub-segment, however Gao discloses a means for time warping start and end points of a speech-sub-segment *(Col. 42, Line 17- Col. 43, Line 14)*.

Lee and Gao are analogous art because they are from a similar field of endeavor in pitch contour coding. Thus, it would have been obvious to a person of ordinary skill in the art, at the

time of invention, to modify the teachings of Lee with the means for time warping start and end points of a speech-sub-segment as taught by Gao in order to implement an efficient pitch contour coding process capable of determining optimal start and ending times for a pitch contour segment *(Gao, Col. 42, Line 9- Col. 43, Line 14)*.

With respect to **Claim 2**, Lee discloses:

The pitch contour data in the audio segment in time is approximated by a plurality of selected candidates, corresponding to a plurality of consecutive sub-segments in said audio segment, each of said plurality of selected candidates defined by a first end point and a second end point, and wherein said coding comprises the step of providing information indicative of the end points so as to allow the decoder to reconstruct the audio signal in the audio segment based on the information instead of the pitch contour data *(end points and coding, Sections V-V.A.; Page 486-487; Fig. 5; and decoder, Abstract; Fig. 1)*.

With respect to **Claim 3**, Lee teaches the multiple pitch parameters per interval as shown in Fig. 5.

With respect to **Claim 4**, Lee teaches a maximum allowable contour approximation error threshold *(Section V.A., Page 486-487)*.

With respect to **Claim 5**, Lee teaches that if a longest candidate has an acceptable approximation error, no additional endpoints, which would result in shorter segments, are utilized *(Section VA, Pages 486-487)*. Lee also teaches coding based on the fewest number of endpoints needed to encode a pitch contour *(Section V-VB, Pages 486-488)*.

With respect to **Claim 7**, Gao teaches the method for time warping and optimal endpoint determination of a pitch contour segment, as applied to Claim 1.

With respect to **Claim 8**, Lee teaches the linear estimation of a pitch contour as applied to claim 1, which is related to speech coding *(Abstract)*.

With respect to **Claim 9**, Lee shows a pitch contour approximation as a linear segment *(Fig. 5)*.

With respect to **Claim 10**, Lee teaches a B-spline approximation for a smoothed approximation of a pitch contour *(Section V.A., Page 487)*.

With respect to **Claim 11**, Lee recites:

An input end for receiving the pitch contour data *(Fig. 1)*; and

A data processing module, responsive to the pitch contour data, for creating a plurality of simplified pitch contour segment candidates, each candidate corresponding to a sub-segment of the audio signal, wherein each sub-segment and candidate has a start-point pitch value and an end point pitch value and wherein the processing module comprises *(F0 coding, Fig. 1; and Section V.A., Pages 486-487)*:

An algorithm for measuring deviation between each of the simplified pitch contour segment candidates and said pitch values in the corresponding sub-segment; and an algorithm for selecting a plurality of consecutive segment candidates to represent the audio segment based on the measured deviations and one or more pre-selected criteria *(error calculation and selecting candidates with error below a threshold amount, Section V.A., Page 486-487; and Fig. 5)*.

Lee does not specifically suggest that start and end points of a pitch contour sub-segment candidate may vary from that of an original speech sub-segment, however Gao discloses a means for time warping start and end points of a speech-sub-segment *(Col. 42, Line 17- Col. 43, Line 14)*.

Lee and Gao are analogous art because they are from a similar field of endeavor in pitch contour coding. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Lee with the means for time warping start and end points of a speech-sub-segment as taught by Gao in order to implement an efficient pitch contour coding process capable of determining optimal start and ending times for a pitch contour segment *(Gao, Col. 42, Line 9- Col. 43, Line 14)*.

With respect to **Claim 12**, Lee teaches a means for compressing an approximated pitch contour *(Section V, Page 486 and Section VI, Page 488)*.

With respect to **Claim 15**, Lee teaches the decoder having a concatenation unit as shown in Fig. 1.

With respect to **Claim 17**, Lee in view of Gao teaches the pitch contour approximation encoder as applied to Claims 1 and 2. Lee also teaches the decoder as shown in Fig. 1 having a means for accepting data from an encoder and a unit concatenation module for reconstructing speech data.

Claim 20 contains subject matter similar to Claim 17, and thus, is rejected for the same reasons.

5. **Claim 6** is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al in view of Gao, and further in view of Swaminathan et al (U.S. Patent: 5,704,000).

With respect to **Claim 6**, Lee in view of Gao teaches the pitch contour approximation means as applied to Claim 4. Lee in view of Gao does not specifically suggest comparing candidates having the same length and selecting the candidate with the minimum deviation,

however Swaminathan teaches a means for selecting from a plurality of pitch candidates corresponding to pitch parameters of a specific pitch period (Col. 5, Line 14- Col. 48).

Lee, Gao, and Swaminathan are analogous art because they are from a similar field of endeavor in speech coding. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Lee in view of Gao with the means for comparing multiple pitch candidates to an original speech signal for a single pitch contour interval as taught by Swaminathan in order to further account for pitch estimation errors caused by spurious contaminants and distortion *(Swaminathan, Col. 5, Lines 23-31)*.

6. **Claims 13-14, 16, 18-19, and 21-24** are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al in view of Gao and further in view of Lumelsky *(U.S. Patent: 6,246,672)*.

With respect to **Claims 13 and 14**, Lee in view of Gao teaches the pitch contour approximation encoder as applied to Claims 11 and 12. Lee also teaches the transmission of encoded audio data to a decoder (Fig. 1; and Page 486, Section V). Lee in view of Gao does not teach the storage of compressed audio data, however Lumelsky teaches a storage means coupled to an encoder for storing encoded audio data *(Col. 6, Lines 32-56)*.

Lee, Gao, and Lumelsky are analogous art because they are from a similar field of endeavor in speech coding. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Lee in view of Gao with the means for storing encoded audio data as taught by Lumelsky to implement a user-initiated means for playback of encoded audio information *(Lumelsky, Col. 6, Lines 39-43)*.

With respect to **Claim 16**, Lee in view of Gao teach the pitch contour approximation encoding method as applied to Claim 1, but do not specifically suggest implementing that method as a computer program stored on a computer readable medium. Lumelsky, however, teaches storing an encoding method on a computer readable medium for the benefit of easily implementing an encoding method using a computer *(Lumelsky, Col. 18, Lines 51-65)*.

With respect to **Claims 18 and 19**, Lumelsky teaches the storage repository as applied to Claim 13 and further shows a wireless communication channel and decoder for decoding received audio data from the repository *(Fig. 1)*.

Claims 21 and 22 contain subject matter similar to Claims 18 and 19, and thus, are rejected for the same reasons.

With respect to **Claim 23**, Lumelsky further teaches a mobile user terminal connected to a wireless network *(Fig. 1)*.

With respect to **Claim 24**, Lee in view of Gao teach the speech coding system utilizing piecewise linear approximation as applied to Claim 17. Lee in view of Gao do not specifically disclose a communication network having a plurality of base and mobile stations, however Lumelsky teaches such a communication network *(base stations and mobile terminals, Col. 8, Lines 17-60)*.

Lee, Gao, and Lumelsky are analogous art because they are from a similar field of endeavor in speech coding. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Lee in view of Gao with the communication network having multiple user terminals and base stations as taught by Lumelsky in order to implement a convenient communication medium for providing encoded audio content

to a user upon request using a readily available wireless network *(Lumelsky, Col. 5, Lines 36-50, and Col. 6, Lines 32-56).*

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Jeanrenaud et al ("Segment Vocoder Based on Reconstruction with Natural Segments," 1991)- teaches a means for coding pitch data using piecewise linear approximation and floating block boundaries.

Febrer et al ("Aneto: A tool for Prosody Analysis of Speech," 1998)- teaches a method for approximating a pitch contour using a variable number of linear segments.

Gournay et al *(US 2002/0065655)*- teaches a low bit rate encoder that utilizes linear segments to approximate a pitch contour.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James S. Wozniak whose telephone number is (571) 272-7632. The examiner can normally be reached on M-Th, 7:30-5:00, F, 7:30-4, Off Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young can be reached on (571) 272-7582. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

James S. Wozniak
10/24/2005

W. R. YOUNG
PRIMARY EXAMINER